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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Metabolism Standard Review of PMN 89-867

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[redacted]

I. INTRODUCTION

PMN substance 89-867, [redacted], Figure 1), is a solid with a molecular weight of [redacted] a melting point of [redacted]°C, and water solubility of [redacted] ppb @ [redacted]°C (PMN submission), and an estimated log P of 11 (SAT Report).

II. CONCLUSIONS

A. Absorption: The PMN substance is not expected to be absorbed via the skin; it is, however, expected to be very poorly absorbed from the lung and GI tract.

[redacted]

B. Metabolism: The PMN substance may undergo some metabolism in the body, most likely debromination. Excretion is expected to be primarily in the bile with lesser amounts in the urine. A portion of the absorbed dose may accumulate in tissue.

III. BASES FOR CONCLUSIONS

A. Absorption:

1. Skin: In general solids with high melting points do not penetrate the skin unless present as very fine particulates (Schaefer et al., 1982).

2. Lung: In general compounds absorbed from the GI tract are also absorbed from the lung (Brown, 1974).

3. GI Tract: In male Fischer 344 rats fed a diet containing decabromobiphenyl ether (MW = [redacted] DBBE, Figure 1), a perbrominated aromatic compound with a molecular weight similar to that of the PMN substance, from 0.004 to 0.012% of the dose was excreted in the urine; an additional 0.129 to 1.03% of the dose was present in various tissues and fluids at sacrifice. In bile duct cannulated rats dosed via iv injection approximately 7% of the dose was excreted in the bile (El Dareer et al., 1987). These results suggest that at least 1% and perhaps as much as 10% of an oral dose of [redacted] may be absorbed from the GI tract.

B. Metabolism: In the study cited above, El Dareer et al. (1987) demonstrated the presence of three metabolites of DBBE in the feces; however, these metabolites were not identified. The only metabolism possible in this compound is debromination which could be either reductive to yield less brominated derivatives of DBBE or hydrolytic to yield phenolic derivatives of [redacted]

Excretion of the radioactivity associated with DBBE and its metabolites was via the bile with minor amounts excreted in the urine. Up to 1% of the dose of radioactivity was present in the carcass at sacrifice, the majority of which was present in the skin (0.036 - 0.248% of the dose; no explanation for this was offered by the authors (El Dareer, 1987). The accumulation of DBBE in skin may be related to the affinity of polybrominated aromatic compounds for lipids. For example, Matthews et al. (1977) report that [redacted] are passively excreted in skin oil.

PMN Substance 89-867

[redacted]

Analogue

[redacted]

Figure 1. Structures of PMN Substance 89-867 and Analogue.

[redacted]

REFERENCES

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[redacted]